What is claimed is:

1. A multi-point control protocol processing apparatus over an Ethernet Passive Optical Network (PON) including an Optical Line Termination (OLT) and an Optical Network Unit (ONU), the apparatus comprising:

a CPU interface unit which connects to an external CPU, and receives and sends data from/to the external CPU;

an SGA table memory which stores a plurality of static grant allocation information entries written therein, in a linked-list structure;

a RTT table memory which stores RTT values for each LLID;

a memory arbitration control unit which controls access of the SGA table memory and RTT table memory;

a static grant generation unit which generates static grant frames periodically for each logical link identification (LLID) according to static grant generation information from the SGA table memory which was set by the CPU;

a dynamic grant generation unit which reads grant request information, for data transmission process, from a report queue and generates the dynamic grant frames according to LLID and grant request information;

a static grant queue which stores the static grant frames generated from the static grant generation unit;

a dynamic grant queue which stores the dynamic grant frames generated from the dynamic grant generation unit;

a sending message queue which stores sending message frames from the CPU;

a sending multiplexing unit which receives and schedules sending requirement signals transmitted from an external PON bridge, the static grant queue, the dynamic grant queue and the sending message queue, wherein one signal is selected, and contents of a corresponding queue are output;

a time setting unit which sets start time information of any passing grant frames, and transfers an Ethernet frame, output from the sending multiplexing unit, to a media access control (MAC) sending unit;

a receiving demultiplexing unit which demultiplexes an Ethernet frame received from a MAC receiving unit;

a report queue which stores report information received from the receiving demultiplexing unit; and

a received message queue which stores Ethernet frames to be transferred from the receiving demultiplexing unit to the CPU.

2. The apparatus of claim 1, further comprising:

an upstream grant queue which stores grant information transmitted to the ONU; and

a receiving window generation unit which reads grant information transmitted already from the upstream grant queue to the ONU, and calculates an expectation time at which a frame transmitted from the ONU reaches the OLT.

3. The apparatus of claim 1, wherein in the sending multiplexing unit, the sending requirement signal transmitted from the external PON bridge includes length information of an Ethernet frame.

4. The apparatus of claim 1, wherein the static grant frame includes a LLID, a MAC address and grant length information.

5. The apparatus of claim 1, wherein the static grant generation unit reads a linked list of entries stored in SGA table memory, at predetermined time periods, to generate a grant as indicated by an operation instruction space, and reads a next entry, according to a pointer, to create a grant frame including a LLID, a duration, and a destination address (DA) on the basis of entry information.

6. The apparatus of claim 1, wherein the dynamic grant generation unit always sets grant start time to a later time, by a predetermined offset, than current time.

7. A grant scheduling method in a multi-point control protocol processing method over an Ethernet Passive Optical Network (PON) including an Optical Line Termination (OLT) and an Optical Network Unit (ONU), the method of grant scheduling comprising:

(a) determining the length of the grants separately for static and dynamic grants;

(b) determining the start time of the grants after the static and dynamic grants are multiplexed;

(c) subtracting the RTT value of the corresponding ONU from the start time,

where in the step (b) further comprising of last scheduled time register which is incremented for each generated grant as much as the length of the grant and after this increment, becomes the start time of the following grant, and when there was not any grant for a predetermined time, so that the last scheduled time register has become a past value or it is not sufficiently ahead of the current time by a predetermined time, the last scheduled time register is advanced to a future time with a predetermined minimum offset.

8. The method of claim 7, wherein when the last scheduled time register is advanced than the current timer more than a predetermined amount of time, the scheduler assumes that there has been too much grant request from the ONUs and reduces the amount of grant assignment thus resulting in grants shorter than requested values.

9. The apparatus for IEEE 802.3ah based Ethernet PON OLT device, wherein when the register_req message was received for the first time from an ONU, the measured RTT value is overwritten to the FCS portion of the received frame and delivered to the CPU with the frame and the RTT value is written back to the RTT table later for the first normal grant transmission to the ONU after LLID assignment.

10. The apparatus for IEEE 802.3ah based Ethernet PON OLT device, wherein the grant value contained in the gate message contains the priority of the grant, the priority indicating the ONU's queue number to be serviced by the grant.